

**January 1983-December 1983**  
**Author Index**  
**School Science and Mathematics**

- Abimbola, Isaac O. The Relevance of the "New" Philosophy of Science for the Science Curriculum. March 1983, 181.
- Becker, Jerry P., and James G. Ware. Mathematics Education in the Chinese Middle School. January 1983, 39.
- Beckmann, Milton, Larry Stephens, and Ivan Stones. Factors Influencing Attitudes toward Mathematics in Pre-Calculus College Students. May/June 1983, 430.
- Berdonneau, Catherine, and Rose-Marie Dumas (Tr. by Thomas C. O'Brien). Twelve Loves Move. December 1983, 631.
- Berman, Barbara, and Fredda J. Friederwitzer. Teaching Fractions without Numbers. January 1983, 77.
- Bidwell, James K. Calculation Skills vs. Problem Solving: Scotland vs. Michigan. December 1983, 682.
- Bitter, Gary G. Editorial. October 1983, 451.
- Bitter, Gary G. Editorial: Before You Submit Your Article. January 1983, 1.
- Bitter, Gary G. Editorial: Random Thoughts. May/June 1983, 361.
- Blosser, Patricia E. (What Research Says:) Creationism vs. Evolution. March 1983, 222.
- Blosser, Patricia E. (What Research Says:) The Role of the Laboratory in Science Teaching. February 1983, 165.
- Blosser, Patricia E. (What Research Says:) Teaching Science to Middle School Students, Part I. October 1983, 516.
- Blosser, Patricia E. (What Research Says:) Teaching Science to Middle School Students, Part II. November 1983, 609.
- Blosser, Patricia E. (What Research Says:) Teaching Science to Middle School Students, Part III. December 1983, 694.
- Blume, Glendon W., and Charles E. Mitchell. Distributivity: A Useful Model or an Abstract Entity? March 1983, 216.
- Blurton, Craig. Individualized Science Packets for Gifted Students. April 1983, 326.
- Blurton, Craig. Science Talent: The Elusive Gift. December 1983, 654.
- Brandes, Louis Grant. Optical Illusions: A Presentation for High School Mathematics Students. February 1983, 149.
- Bratt, Marvin. Microcomputers in Elementary Science Education. April 1983, 333.
- Bright, George W. Applying a Sociological Concept about Sex Differences to Science and Math Teaching. November 1983, 568.
- Bright, George W., John G. Harvey, and Margariete Montague Wheeler. Use of a Game to Instruct on Logical Reasoning. May/June 1983, 396.
- Burton, Grace M., and J. Dan Knifong. What Does Division Mean? October 1983, 464.
- Byrd, Frances, and Ernest Woodward. Area: Included Topic, Neglected Concept. April 1983, 343.
- Casey, Shirley A., and Thomas C. O'Brien. Children Learning Multiplication—Part I. March 1983, 246.
- Casey, Shirley A., and Thomas C. O'Brien. Children Learning Multiplication—Part II. May/June 1983, 407.
- Clark, H. Clifford, and J. Truman Stevens. Criterion-Referenced Evaluation of Student Teachers in Science.
- Cooper, Curtis N., Terry A. Goodman, and Robert E. Kennedy. Chords, Arcs and Iteration. April 1983, 318.
- Craven, Patricia A., and James J. Roberge. Deductive Reasoning and Its Relationship to Reading Comprehension. January 1983, 69.
- Davis, Shelley. Software Review: Basic Math Facts and Math Regrouping Games. October 1983, 526.
- Davis, Shelly, Software Review: Numeration 2, Symbols to Moles, Computer Literacy Instructional Program. November 1983, 616.
- Davis, Shelley, Software Review: Hallmark's Knowledge Master and Basic Math Skills Package. December 1983, 703.
- Dede, Christopher J. Future Challenges for Science and Mathematics Education. May/June 1983, 363.

### *January-December 1983 Index*

- DiVincenzo, Robert M. Erastosthenes in Scientific Garb. October 1983, 485.
- Dumas, Rose-Marie and Catherine Berdonneau (Tr. by Thomas C. O'Brien). Twelve Loves Move. December 1983, 631.
- Duncan, David R., and Bonnie H. Litwiller. An Unusual Lottery: Probabilities and Expectations. November 1983, 560.
- Duschl, Richard A. The Equal Time Request: Implications toward Teachers and the Curriculum. April 1983, 299.
- Edge, Douglas R. M., and Michael K. Dirks. Problem Solving, Enrico Fermi, and the Bull Moose. November 1983, 601.
- Educational Software Evaluation Consortium. The 1983 Educational Software Preview Guide. May/June 1983, 375.
- Friederwitzer, Fredda J., and Barbara Berman. Teaching Fractions without Numbers. January 1983, 77.
- Gabel, Dorothy. Book Review: Fundamentals of Chemistry (James E. Brady and John R. Halum). February 1983, 159-160.
- Gibney, Thomas C., and Steven P. Meiring. Problem Solving: A Success Story. March 1983, 194.
- Glass, Lynn W. Business and Industrial Support of High School Science Education. February 1983, 91.
- Good, Ron and Robert Kromhout. Beware of Societal Issues as Organizers for Science Education. December 1983, 647.
- Goodman, Terry A., Robert E. Kennedy, and Curtis N. Cooper. Chords, Arcs and Iteration. April 1983, 318.
- Green, David R. From Thumbtacks to Inference. November 1983, 541.
- Haga, Enoch J. Robert H. Goddard, Father of the Liquid Fuel Rocket. April 1983, 348. (Reprinted from the November 1960 School Science and Mathematics.)
- Haladyna, Tom, Michael Shaughnessy, and Joan Shaughnessy. Relations of Student, Teacher, and Learning Environment Variables to Attitude toward Mathematics. January 1983, 21.
- Haney, Richard E., and Myra K. Vachon. Analysis of Concepts in an Eighth Grade Science Textbook. March 1983, 236.
- Hannick, Francis T. A Note of Divisibility by Seven. November 1983, 565.
- Harvey, John G., Margariete Montague Wheeler, and George W. Bright. Use of a Game to Instruct on Logical Reasoning. May/June 1983, 396.
- Hennemann, A. Louise, and Willard Hennemann. Hand-Held, Hand-Dialed: Another Kind of Calculator Experience for the Elementary School. April 1983, 293.
- Hennemann, Willard, and A. Louise Hennemann. Hand-Held, Hand-Dialed: Another Kind of Calculator Experience for the Elementary School. April 1983, 293.
- Hiebert, James, and Wearne-Hiebert, Diana. Junior High School Students' Understanding of Fractions. February 1983, 96.
- Hohlfeld, Joe. Algebra and the Computer in Problem Solving: An Example. December 1983, 675.
- Hovey, Kathi, and Larry Hovey. The Metric System—An Overview. February 1983, 112.
- Hovey, Larry, and Kathi Hovey. The Metric System—An Overview. February 1983, 112.
- Juraschek, William. Piaget and Middle School Mathematics. January 1983, 4.
- Kennedy, Robert E., Curtis N. Cooper, and Terry A. Goodman. Chords, Arcs and Iteration. April 1983, 318.
- Knifong, J. Dan, and Grace M. Burton. What Does Division Mean? October 1983, 464.
- Kromhout, Robert and Ron Good. Beware of Societal Issues as Organizers for Science Education. December 1983, 647.
- Kurtz, Ray. Mathematics for Elementary and Middle School Gifted Students. November 1983, 576.
- Lappan, Glenda, and Elizabeth Phillips. A Mathematical Unit for Gifted Junior High School Students. December 1983, 665.
- Lawrenz, Frances. Student Knowledge of Energy Issues. November 1983, 578.
- Litwiller, Bonnie H., and David R. Duncan. An Unusual Lottery: Probabilities and Expectations. November 1983, 560.
- Long, Calvin T. A Modern Mathematics Fable. February 1983, 140.
- Lulli, Henry. Four-Digit Subtraction Palindromes. October 1983, 503.
- Markel, William D. The Calculus of Exponential Functions. April 1983, 352.

### *January-December 1983 Index*

- May, Sadie, and Lionel Pereira-Mendoza. The Environment—A Teaching Aid. January 1983, 54.
- McNerney, Charles R. Geometric Series and Computers—An Application. February 1983, 143.
- Meiring, Steven P., and Thomas C. Gibney. Problem Solving: A Success Story. March 1983, 194.
- Mitchell, Charles E. An Introductory Unit in Non-Euclidean Geometry for the High Schools. April 1983, 338.
- Mitchell, Charles E. The Non-commutativity of Subtraction. February 1983, 133.
- Mitchell, Charles E., and Blume, Glendon W. Distributivity: A Useful Model or Abstract Entity. March 1983, 216.
- Moe, David. What Is Science? March 1983, 255. (Reprinted from the June 1964 School Science and Mathematics.)
- Moseley, Nicholas. Pasteur: Student and Teacher. March 1983, 228.
- Muliak, Stanley B. Broadening One's Teaching Base. February 1983, 170. (Reprinted from the June 1960 School Science and Mathematics.)
- O'Brien, Thomas C., and Shirley A. Casey. Children Learning Multiplication—Part I. March 1983, 246.
- O'Brien, Thomas C., and Shirley A. Casey. Children Learning Multiplication—Part II. May/June 1983, 407.
- Pereira-Mendoza, Lionel, and Sadie May. The Environment—A Teaching Aid. January 1983, 54.
- Phillips, Elizabeth, and Glenda Lappan. A Mathematical Unit for Gifted Junior High School Students. December 1983, 665.
- Retish, Paul, and Jan S. Wielert. Mainstreaming and the Science Teacher. November 1983, 552.
- Richmond, Alan, and H. Clifford Clark. Seven Years Since the Act: Metric Achievement in Simi Valley. November 1983, 596.
- Roberge, James J., and Patricia A. Craven. Deductive Reasoning and Its Relationship to Reading Comprehension. January 1983, 69.
- Schibeci, Renato A., and Irene Sorensen. Elementary School Children's Perceptions of Scientists. January 1983, 14.
- Scott, Patrick B. A Survey of Perceived Use of Mathematics Materials by Elementary Teachers in a Large Urban School District. January 1983, 61.
- Shaughnessy, J. Michael, Joan Shaughnessy, and Tom Haladyna. Relations of Student, Teacher, and Learning Environment Variables to Attitude toward Mathematics. January 1983, 21.
- Shaughnessy, Joan, Tom Haladyna, and J. Michael Shaughnessy. Relations of Student, Teacher, and Learning Environment Variables to Attitude toward Mathematics. January 1983, 21.
- Shringle, Robert C. Persuade, Mandate, and Reward: A Paradigm for Changing the Science Attitudes and Behaviors of Teachers. March 1983, 204.
- Signer, Barbara. How the Literature and a Research Study Agree on CAI Innovation Success or Failure. April 1983, 307.
- Sorensen, Irene, and Renato A. Schibeci. Elementary School Children's Perceptions of Scientists. January 1983, 15.
- Stephens, Larry, Ivan Stones, and Milton Beckmann. Factors Influencing Attitudes toward Mathematics in Pre-Calculus College Students.
- Stewart, James. Positive Consequences of the Current Interest in Creationism. April 1983, 271.
- Stones, Ivan, Milton Beckmann, and Larry Stephens. Factors Influencing Attitudes toward Mathematics in Pre-Calculus College Students. May/June 1983, 430.
- Streibel, Michael J. The Educational Utility of LOGO. October 1983, 474.
- Threadgill-Sowder, Judith. Question Placement in Mathematical Word Problems. February 1983, 107.
- Vachon, Myra K., and Richard E. Haney. Analysis of Concepts in an Eighth Grade Science Textbook. March 1983, 236.
- Ware, James G., and Jerry P. Becker. Mathematics Education in the Chinese Middle School. January 1983, 39.
- Wearne-Hiebert, Diana C., and James Hiebert. Junior High School Students' Understanding of Fractions. February 1983, 96.

### *January-December 1983 Index*

- Wheeler, Margariete Montague, George W. Bright, and John G. Harvey. Use of a Game to Instruct on Logical Reasoning. May/June, 396.
- Wielert, Jan S., and Paul Retish. Mainstreaming and the Science Teacher. November 1983, 552.
- Wills, Herbert. Leonardo Da Vinci's Design. October 1983, 453.
- Wiebe, James H. Needed: Good Mathematics Tutorial Software for Microcomputers. April 1983, 281.
- Wiebe, James H. Physical Models for Symbolic Representations in Arithmetic. October 1983, 492.
- Wollman, Warren. Models and Procedures: A Classroom Study of Teaching for Transfer. February 1983, 122. (Revised article printed May/June 1983, 419.)
- Woodward, Ernest, and Frances Byrd. Area: Included Topic, Neglected Concept. April 1983, 343.
- Yager, Robert E. In Defense of Societal Issues as Organizers for School Science. December 1983, 651.

### **January 1983-December 1983**

#### **Title Index**

- Algebra and the Computer in Problem Solving: An Example. Joe Hohlfeld. December 1983, 675.
- Analysis of Concepts in an Eighth Grade Science Textbook. Myra K. Vachon and Richard E. Haney. March 1983, 236.
- Applying a Sociological Concept about Sex Differences to Science and Math Teaching. George W. Bright. November 1983, 568.
- Area: Included Topic, Neglected Concept. Ernest Woodward and Frances Byrd. April 1983, 343.
- Broadening One's Teaching Base. Stanley B. Muliak. February 1983, 170. (Reprinted from the June 1960 School Science and Mathematics.)
- Business and Industrial Support of High School Science Education. Lynn W. Glass. February 1983, 91.
- Before You Submit Your Article (Editorial). Gary G. Bitter. January 1983, 1.
- Calculation Skills vs. Problem Solving: Scotland vs. Michigan. James K. Bidwell. December 1983, 682.
- The Calculus of Exponential Functions. William D. Markel. April 1983, 352.
- Children Learning Multiplication—Part I. Thomas C. O'Brien and Shirley A. Casey. March 1983, 246.
- Children Learning Multiplication—Part II. Thomas C. O'Brien and Shirley A. Casey. May/June 1983, 407.
- Chords, Arcs and Iteration. Robert E. Kennedy, Curtis N. Cooper, and Terry A. Goodman. April 1983, 318.
- Creationism vs. Evolution (What Research Says). Patricia E. Blosser. March 1983, 222.
- Deductive Reasoning and Its Relationship to Reading Comprehension. James J. Roberge and Patricia A. Craven. January 1983, 69.
- Distributivity: A Useful Model or Abstract Entity. Charles E. Mitchell and Glendon W. Blume. March 1983, 216.
- Editorial. Gary G. Bitter. October 1983, 451.
- The Educational Utility of LOGO. Michael J. Streibel. October 1983, 474.
- Elementary School Children's Perceptions of Scientists. Irene Sorenson and Renato A. Schibeci. January 1983, 15.
- The Environment—A Teaching Aid. Lionel Pereira-Mendoza and Sadie May. January 1983, 54.
- The Equal Time Request: Implications towards Teachers and the Curriculum. Richard A. Duschl. April 1983, 299.
- Erastosthenes in Scientific Garb. Robert M. DiVincenzo. October 1983, 485.
- Factors Influencing Attitudes toward Mathematics in Pre-Calculus College Students. Ivan Stones, Milton Beckmann, and Larry Stephens. May/June 1983, 430.
- Four-Digit Subtraction Palindromes. Henry Lulli. October 1983, 503.

### *January-December 1983 Index*

- From Thumbtacks to Inference. David R. Green. November 1983, 541.
- Future Challenges for Science and Mathematics Education. Christopher J. Dede. May/June 1983, 363.
- Geometric Series and Computers—An Application. Charles R. McNerney. February 1983, 143.
- Hand-Held, Hand-Dialed: Another Kind of Calculator Experience for the Elementary School. A. Louise Hennemann and Willard Hennemann. April 1983, 293.
- How the Literature and a Research Study Agree on CAI Innovation Success or Failure. Barbara Signer. April 1983, 307.
- Individualized Science Packets for Gifted Students. Craig Blurton. April 1983, 326.
- An Introductory Unit in Non-Euclidean Geometry for the High Schools. Charles E. Mitchell. April 1983, 338.
- Junior High School Students' Understanding of Fractions. Diana C. Wearne-Hiebert and James Hiebert. February 1983, 96.
- Leonardo Da Vinci's Design. Herbert Wills. October 1983, 453.
- Mainstreaming and the Science Teacher. Paul Retish and Jan S. Wielert. November 1983, 552.
- A Mathematical Unit for Gifted Junior High School Students. Glenda Lappan and Elizabeth Phillips. December 1983, 665.
- Mathematics for Elementary and Middle School Gifted Students. Ray Kurtz. November 1983, 576.
- Mathematics Education in the Chinese Middle School. Jerry P. Becker and James G. Ware. January 1983, 39.
- The Metric System—An Overview. Kathi Hovey and Larry Hovey. February 1983, 112.
- Microcomputers in Elementary Science Education. Marvin Bratt. April 1983, 333.
- Models and Procedures: A Classroom Study of Teaching for Transfer. Warren Wollman. February 1983, 122. (Revised article printed May/June 1983, 419.)
- A Modern Mathematics Fable. Calvin T. Long. February 1983, 140.
- Needed: Good Mathematics Tutorial Software for Microcomputers. James H. Wiebe. April 1983, 281.
- The 1983 Education Software Preview Guide. Educational Software Evaluation Consortium. May/June 1983, 375.
- The Non-commutativity of Subtraction. Charles E. Mitchell. February 1983, 133.
- A Note on Divisibility by Seven. Francis T. Hannick. November 1983, 565.
- Optical Illusions: A Presentation for High School Mathematics Students. Louis Grant Brandes. February 1983, 149.
- Pasteur: Student and Teacher. Nicholas Moseley. March 1983, 228.
- Persuade, Mandate, and Reward: A Paradigm for Changing the Science Attitudes and Behaviors of Teachers. Robert G. Shrigley. March 1983, 204.
- Physical Models for Symbolic Representations in Arithmetic. James H. Wiebe. October 1983, 492.
- Piaget and Middle School Mathematics. William Juraschek. January 1983, 4.
- Positive Consequences of the Current Interest in Creationism. James Stewart. April 1983, 271.
- Problem Solving: A Success Story. Thomas C. Gibney and Steven P. Meiring. March 1983, 194.
- Problem Solving, Enrico Fermi, and the Bull Moose. Douglas R. M. Edge and Michael K. Dirks. November 1983, 601.
- Question Placement in Mathematical Word Problems. Judith Threadgill-Sowder. February 1983, 107.
- Random Thoughts (Editorial). Gary G. Bitter. May/June 1983, 361.
- Relations of Student, Teacher, and Learning Environment Variables to Attitude toward Mathematics. Joan Shaughnessy, Tom Haladyna, and Michael Shaughnessy. January 1983.
- The Relevance of the "New" Philosophy of Science for the Science Curriculum. Isaac O. Abimbola. March 1983, 181.
- The Role of the Laboratory in Science Teaching (What Research Says). Patricia E. Blosser. February 1983, 165.

### *January-December 1983 Index*

- Robert H. Goddard, Father of the Liquid Fuel Rocket. Enoch J. Haga. April 1983, 348.  
(Reprinted from the November 1960 School Science and Mathematics.)  
Science Talent: The Elusive Gift. Craig Blurton. December 1983, 654.  
Seven Years Since the Act: Metric Achievement in Simi Valley. H. Clifford Clark and Alan Richmond. November 1983, 596.  
Student Knowledge of Energy Issues. Frances Lawrenz. November 1983, 587.  
A Survey of Perceived Use of Mathematics Materials by Elementary Teachers in a Large Urban School District. Patrick B. Scott. January 1983, 21.  
Teaching Fractions without Numbers. Barbara Berman and Fredda J. Friederwitzer. January 1983, 77.  
Teaching Science to Middle School Students, Part I (What Research Says). Patricia E. Blosser. October 1983, 516.  
Teaching Science to Middle School Students, Part II (What Research Says). Patricia E. Blosser. November 1983, 609.  
Teaching Science to Middle School Students, Part III (What Research Says). Patricia E. Blosser. December 1983, 694.  
Twelve Loves Move. Catherine Berdonneau and Rose-Marie Dumas (Tr. by Thomas C. O'Brien). December 1983, 631.  
An Unusual Lottery: Probabilities and Expectations. Bonnie H. Litwiller and David R. Duncan. November 1983, 560.  
Use of a Game to Instruct on Logical Reasoning. Margariete Montague Wheeler, George W. Bright, and John G. Harvey. May/June, 1983, 396.  
What Does Division Mean? J. Dan Knifong and Grace M. Burton. October 1983, 464.  
What Is Science? David Moe. March 1983, 255. (Reprinted from the June 1964 School Science and Mathematics.)

### **Problem Department Index**

January 1983, 83

- (Problems proposed) Stanley Rabinowitz, Albert C. Claus, Michael Brozinsky, Herta T. Freitag (2), Charles W. Trigg. (Problems with published solutions) Herta T. Freitag, solution by the proposer; Herta T. Freitag, Charles W. Trigg; Charles W. Trigg, Raymond E. Warburton; Fred A. Miller, W. C. Igips; Fred A. Miller, W. C. Igips; Michael Brozinsky, solution by the proposer. Correct solutions to the various problems were received from other readers.

February 1983, 172

- (Problems proposed) Stanley Rabinowitz, Charles W. Trigg, V. C. Bailey (2), Fred A. Miller, David C. Wilson. (Problems with published solutions) Mangho Ahuja, Earl E. Keese; Herta T. Freitag, independent solutions by William T. Bailey, Terry King, Tien T. Kuo, and Mangho Ahuja; Alan Wayne, Raymond E. Warburton; Herta T. Freitag, Charles R. Diminnie; Charles W. Trigg, M. Kathleen Heid; Richard L. Francis, P. J. Pedler. Correct solutions to the various problems were received from other readers.

March 1983, 262

- (Problems proposed) Michael Brozinsky, Herta T. Freitag (3), V. C. Bailey, David C. Wilson. (Problems with published solutions) Charles W. Trigg; composite of solutions by Mary S. Krimmel and Vicki Schell; Charles W. Trigg, comment by department editors, solution by Mary S. Krimmel; V. C. Bailey, Charles W. Trigg, V. C. Bailey, Ralph King; David C. Wilson, Herta T. Freitag and Mary S. Krimmel; Herta T. Freitag, Leonard L. Palmer. Correct solutions to the various problems were received from other readers.

April 1983, 356

- (Problems proposed) V. C. Bailey (2), Alan Wayne (3), Richard L. Francis. (Problems with published solutions) Charles W. Trigg, Theodore Eisenberg; David C. Wilson, Stanley Rabinowitz; David C. Wilson, Tien Tao Kuo; Fred A. Miller, Stanley Rabinowitz; Herta T. Freitag, William T. Bailey; Charles W. Trigg, solution by the proposer. Correct solutions to the various problems were received from other readers.

May/June 1983, 443

- (Problems proposed) Charles W. Trigg, Herta T. Freitag, David C. Wilson, Michael Brozinsky, Fred A. Miller. (Problems with published solutions) Gordon Haigh, David E.

### *January-December 1983 Index*

Kullman; Irwin K. Feinstein, Pat Boyle and W. C. Igips; Herta T. Freitag, Michael Brozinsky; Charles W. Trigg, solution by the proposer; Trygve Breiteig, Charles Diminnie; Stanley Rabinowitz (reprint of problem previously misprinted). Correct solutions to the various problems were received from other readers.

October 1983, 532

(Problems proposed) Stanley Rabinowitz, Michael Brozinsky, John Oman and Jimmie Lakin, Susan King, Charles W. Trigg, David C. Wilson, Fred A. Miller. (Problems with published solutions) W. C. Igips, Herta T. Freitag, Morley Coviensky, J. W. Wilson; Shige Kajiwara, solution by the proposer; Charles W. Trigg, Irwin K. Feinstein; Herta T. Freitag, Douglas E. Scott; Charles W. Trigg, solution by the proposer. Correct solutions to the various problems were received from other readers.

November 1983, 624

(Problems proposed) N. J. Kuenzi and Bob Prielipp, Charles W. Trigg, Herta T. Freitag (2), Michael Brozinsky, Andrew C. Cusumano. (Problems with published solutions) Alan Wayne, separate solutions by Douglas E. Scott and Michael Brozinsky; Charles W. Trigg, composite of solutions by Sam Baethge and Raymond E. Warburton; H. Don Allen, Michael Brozinsky; H. Don Allen, solutions by the proposer and Nancy Evans; S. B. Kulkarni, Melfried Olson; Martin LaBar, comment by Enoch Haga. Correct solutions to the various problems were received from other readers.

December 1983, 712

(Problems proposed) Fred A. Miller, V. C. Bailey, Alan Wayne, Bob Prielipp (2). (Problems published with solutions) Stanley Rabinowitz, Michael Brozinsky; Albert C. Claus, Bill Bompert; Michael Brozinsky, Charles W. Trigg; Herta T. Freitag, Melfried Olson; Charles W. Trigg; Patrick J. Boyle; Herta T. Freitag, Raymond E. Warburton. Correct solutions to the various problems were received from other readers.

### **ELECTRON MICROSCOPE**

A highly-sophisticated electron microscope began operation as the heart of a new half-million dollar Analytical Electron Microscope Laboratory at Michigan State University in the fall of 1983. This microscope will permit users to probe the chemical composition of matter with extremely fine resolution, said physics professor Dr. Stuart Solin. An electron microscope operates using a very finely focused beam of electrons directed at a sample. Depending on the thickness and orientation of the sample, images or information about optical, electrical and other properties of a substance can be obtained.

### **CATALYSTS FOR CRUDE OIL**

Catalysts that extract gasoline from crude oil have been developed from smectite clays by Michigan State University professors Dr. Thomas J. Pinnavaia of the chemistry department and Dr. Max Mortland of Geology and Crop and Soil Sciences. The scientists say more work is needed before the catalysts become commercially valuable since many things could cause the catalysts to fail. They believe that two or three more years of work with the catalysts will be necessary before their commercial value can be determined.